

## Production of Mature Highland Lunar Regolith Simulant, Phase I

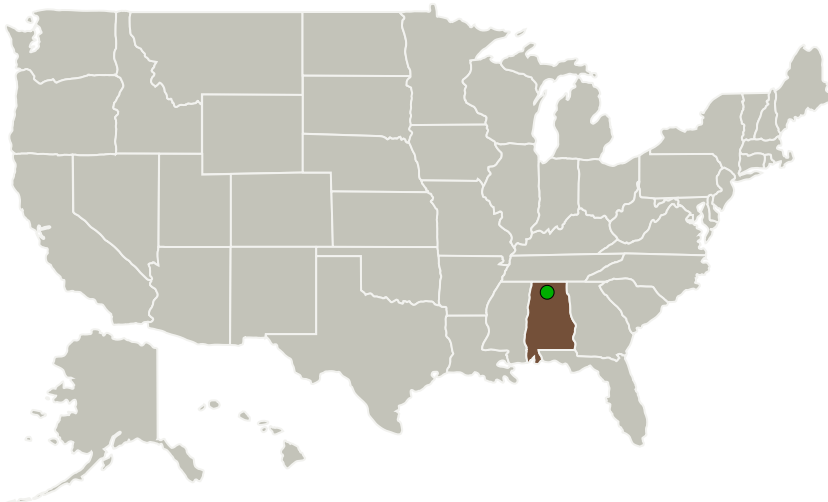
Completed Technology Project (2011 - 2011)



## Project Introduction

As NASA considers manned and/or unmanned return missions to the Moon and beyond, it is imperative that high fidelity lunar soil simulants be developed in order to accurately evaluate the life span and efficiency of any equipment exposed to the lunar surface. One of the significant limitations of current simulants is the lack of certain constituents, such as agglutinates. These constituents, which can account for up to 60% by volume of a mature regolith soil, are widely regarded as components that must be present in any high fidelity simulant. Recently, Plasma Processes, Inc. has developed a process to produce Mare agglutinate simulant particles from JSC-1A feedstock. Characterization has confirmed that these agglutinate simulants have features (e.g. morphology, chemistry, crystalline phase content, nano-phase Fe) similar to actual lunar agglutinates. When mixed with the JSC-1A root simulant in the correct proportions, the combination results in a high fidelity derivative Mare simulant. However, considering approximately 87% of the lunar surface consists of Highland regolith composition, mature Highland simulants are also of great interest. Hence, the primary technical objective of the proposed Phase I effort is to extend the technology employed to enhance the fidelity of Mare simulants to the production of high fidelity derivative Highland simulants.

## Primary U.S. Work Locations and Key Partners



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## Organizational Responsibility

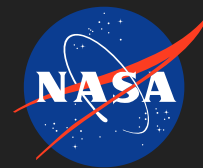
### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
● Marshall Space Flight Center(MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama

## Primary U.S. Work Locations

Alabama

## Project Transitions

▶ **February 2011:** Project Start

✔ **September 2011:** Closed out

## Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138427>)

## Project Management

## Program Director:

Jason L Kessler

## Program Manager:

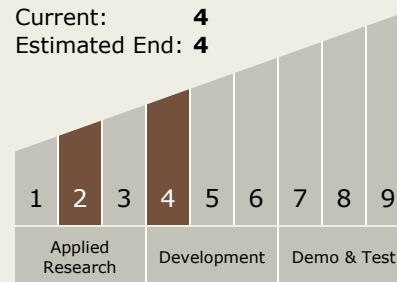
Carlos Torrez

## Principal Investigator:

Daniel Butts

## Technology Maturity (TRL)

Start: 2  
Current: 4  
Estimated End: 4



## Technology Areas

## Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.1 Materials
    - TX12.1.7 Special Materials

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System